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Dr. Elliott Coues adds some highly important observations on the osteology of the family, and compares their more prominent skeletal modifications with those of the other groups of the Pygopodes. Any one of a large number of individual bones, he asserts, is of itself characteristic of the family. "A remarkable breadth and flatness of different bones," he observes, "is the dominant characteristic; it marks several bones that are cylindrical in all other birds and hollow in most;" and adds that "foremost among the diagnostic skeletal characters of the family comes the partly confluent condition of the metatarsals, which in all other existing birds are completely fused." The compound metatarsus "shows its composition in the two lengthened fenestræ that indicate the three original metatarsals;" and Dr. Coues suggests that "this may afford a useful hint in any search for the ancestral stock or primitive type of the *Spheniscidæ*;" yet one of these fenestræ is apparently common to many of the lower water birds; while the primitive distinctness of these bones is indicated by the medullary canals that are readily seen in a transverse section of the distal extremity of the metatarsals.

This carefully prepared paper, by Prof. Hyatt and Dr. Coues, is a welcome and valuable addition to our knowledge of this most interesting and by no means well-known group of birds.

NOTES ON THE NATURAL HISTORY OF FORT MACON, N. C., AND VICINITY.*—Under the above caption, we have a series of papers on the fauna and flora of the vicinity of Fort Macon, North Carolina, by Dr. Elliott Coues, based on two years' observation at that locality. The groups thus far fully reported upon are the Mammals, Birds and Reptiles among Vertebrates, the Crustacea, Radiata, and Mollusca, and also the Brachiopoda of the Annulata. The lists refer almost exclusively to the small island on which Fort Macon is situated, and to the waters immediately surrounding it, thus rendering the paper, by its restriction to a small area, of great value as the record of a local fauna.

The mammals observed number eighteen species, and incorporated with the list are various remarks relating to habits and external features, including about four pages respecting the opossum (*Didelphys Virginiana*). A wide range of individual variation in color, size and proportions of parts is pointed out, in connection

* Notes on the Natural History of Fort Macon, N. C., and Vicinity. By Elliott Coues. Proc. Acad. Nat. Sci. Phila., 1871, pp. 12-49, 120-148, May and July, 1871.

with which is discussed the affinities and alleged points of difference between the *D. Virginiana* of the East and the *D. "Californica"* of the West. The conclusion arrived at is that the two forms are specifically identical, — an opinion we had ourselves but a short time previously expressed.* Respecting their variations Dr. Coues thus remarks: "The more specimens I examined, the more I was struck with the variations that depend upon sex and age, as well as those that different individuals corresponding in these conditions present. An examination of these points, in the natural history of a single animal, may give results of general application; and yet in calling attention to the variability of the opossum, I do not wish to be understood as supposing that the animal is not as constant as many or most others, for I believe it to be no exception to a general standard or average in this respect. I doubt that one could study any mammal, as closely as I have the opossum, without being similarly impressed" (p.15). To the writer of the present notice, who has made individual variation in both mammals and birds a subject of special study for several years, this is cheering testimony, being corroborative of much that he had formerly to support almost alone.†

The list of birds embraces the names of one hundred and forty-two species, with quite extended notes on their habits, and memoranda of their times of arrival, breeding, departure, etc., rendering it highly satisfactory as a faunal list. There is also an extended notice (p.34, foot note) of the pteryxæ of *Rallus crepitans*.

A list of the reptiles concludes the first part, and numbers eleven species. No species of batrachian was noticed on the island, though several were observed on some of the neighboring islands, as well as on the adjoining main land.

Part II begins with an apparently nearly exhaustive list of the decapodous crustacea, part of which were obtained by dredging. Twenty-eight species are enumerated, and one cirriped and one entomostracan, accompanied by full notes respecting their relative abundance, habits and conditions of occurrence. Most of the species were determined by Prof. S. I. Smith, and the remainder by the late Dr. Wm. Stimpson, whose loss to science naturalists have so recently had cause to deplore. The Brachiopoda, next in

* Bull. Mus. Comp. Zool., Vol. ii, p. 185, Apr., 1871.

† See Bull. Mus. Comp. Zool., Vol. i, No. 3 (Oct. 1839), and Vol. ii, Nos. 1 and 3 (Oct. 1870, and Apr., 1871).

order, consist of the single species, *Lingula pyramidata* Stimp., which was found in great numbers at a particular locality on the southern side of Bird Shoals.

The list of the Mollusca seems particularly full, upwards of one hundred and fifty species being enumerated, all but seven of which are marine. The marine species were referred for determination to Mr. Sanderson Smith, who has added various remarks respecting the peculiarities, etc., of the specimens examined. A portion of the species were obtained with the dredge, these being collected jointly by Drs. Coues and Packard and Prof. Morse, who together thus quite thoroughly explored every part of the harbor. Dr. Coues has added important notes respecting their several stations, abundance, etc., which add greatly to the value of the paper. While a few species obtained at this locality by Drs. Stimpson and Gill, in 1860, were not observed, some thirteen were added to Dr. Stimpson's list.

The partial list of the radiates collected embraces ten species, and the occurrence of nearly as many more, not fully identified, is indicated. Preceding the list of the mollusca is a quite detailed description of the locality explored, including the currents and shoals, with other interesting general remarks. An allusion to the changeableness of the locality recalls to us some interesting facts respecting the influence of sometimes single storms upon the fauna of some of our coast inlets. Some years since, a heavy westerly February gale depressed the water in a little bay off Orleans, Cape Cod, to such a degree that large portions of the flats usually covered at low water were laid bare, and remained so for a number of hours. The temperature at the time being in the vicinity of zero, F., a crust of ice formed over these exposed flats, which were at this time literally filled with living *Mya arenaria*, and the larger species of "razor-fish." A few years later, on visiting the locality, hardly a living specimen of either of these species could be found, but just beneath the surface the dead shells occurred in immense abundance, standing on end in their natural positions, the animals having been killed, undoubtedly, by the chilling consequent upon the exposure of the flats during the storm.

A similar destruction of molluscan life, but from another cause, came to our notice last summer (1871) near Great Salt Lake, Utah, where the water of Sulphur Springs Lake, near Salt Lake City, became so reduced in volume by evaporation as to kill all the

shells, through the excess of saline matter held in solution by the water. These shells embraced several species, which were abundantly represented. Such facts as these seem to explain the occurrence of beds of fossils under circumstances which show that they died from some sudden, though not very evident, cause.

Dr. Coues's paper forms a highly valuable contribution to the natural history of Beaufort harbor, and one that students of geographical zoology will heartily welcome. — J. A. A.

GIEBEL'S THESAURUS.* — Close upon the notable "Hand-list," of which we were lately called upon to speak, comes another general work of greater aims and claims. We have as yet only the first twenty-five signatures, constituting the first "halbband;" and we may sincerely say we wish it were necessary to wait for the whole, before judging the work, in the hope of some decided improvement becoming manifest. But as what we have in hand finishes the "Repertorium" and fairly opens the "Nomenclator," the character of the work is fully exposed. We had been led to expect great things of the *Thesaurus*, and opened it with perfect confidence; at the close of our examination—the longer protracted because our convictions became the more painfully prominent, and we were anxious to find ourselves in the wrong—we could not but regret that the fruits of such immense labor should be marred for lack of the *care* necessary for the compilation of works of reference. Dr. Giebel is sure of a storm of hostile criticism, that his work singularly invites if it does not actually enforce; for the simple reason that it is thoroughly unreliable. We have never seen a work of any considerable claims and merit, that more richly deserved the epithet "slovenly." It fairly bristles with misstatements; probably this whole number of the *NATURALIST* would not more than suffice to point out and correct them. The more's the pity, too, that this monument of laborious research should be defaced, not by lack of ability, not by erroneous opinions, not particularly by ignorance, but simply by carelessness. Yet, honey-combed with inaccuracy as it is, the work will, we are glad to say, become indispensable; it will find its place at the elbow of every working ornithologist; it represents too much hard work for any other result to be possible.

**Thesaurus Ornithologie*. Repertorium der gesammten ornithologischen literatur, und Nomenclator sämtlicher gattungen und arten der vögel, nebst synonymen und geographischer verbreitung. Von Dr. C. G. Giebel, Professor an der Universität in Halle. In zwei Bänden oder vier Halbbänden. Leipzig: F. A. Brockhaus. 1872.